

Response/Amendment to Official Action of 29 June 06 SN: 799,459 Filed: 12 March 2004
Inventor: Anthony J. Hadala Confirmation: 7698 Examiner: Frank, Rodney T. TC A/U: 2856
Title: A Temperature-Sensing Device for Determining the Level of a Fluid Docket: 1286

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1 (previously presented): A method for determining the level of fluid in a container comprising:

- obtaining a container having an outlet for a first fluid and an inlet for a second fluid;
- said container having a first fluid region therein;
- a first fluid being present at an original level in said first fluid region of said container;
- said container, for when in use, having said first fluid at least partially removed from said container thereby forming a second fluid region;
- placing on at least one exterior surface of said container at least one temperature-measuring device operating at a single discrete temperature;
- at least one said temperature-measuring device being located in a region of said container where said second fluid region is formed by removal of said first fluid;
- initially observing a first temperature in said first fluid region of said container when said first fluid is present in said first fluid region of said container;
- subsequently observing a second temperature in said second fluid region of said container after a portion of said first fluid has been removed;
- correlating the difference between said first temperature and said second temperature to the level of said first fluid in said container; and,
- provided further that the temperature measuring device is based on a member selected from the group consisting of a leuco dye, a clearing point liquid crystal, cholesteric liquid crystal, chiralnematic liquid crystal, and mixtures thereof.

Claim 2. (previously presented): The method for determining the level of said first fluid in said container according to claim 1 wherein said first fluid is at least

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partially withdrawn through said outlet between the time of observing said first temperature and said second temperature.

Claim 3. (previously presented): The method for determining the level of said first fluid in said container according to claim 1 wherein the second fluid is introduced through said inlet between the time of observing said first temperature and said second temperature.

Claim 4. (previously presented): The method for determining the level of said first fluid in said container according to claim 1 wherein said second fluid is a gas.

Claim 5. (canceled).

Claim 6. (previously presented): The method for determining the level of said first fluid in said container according to claim 1 wherein said temperature-measuring device is adhered to an outer surface of said container as a magnetic strip.

Claim 7. (previously presented): The method for determining the level of said first fluid in a container according to claim 1 wherein a plurality of temperature-measuring devices are sequentially located in the regions of said container where said second fluid region is formed by removal of said first fluid.

Claim 8. (previously presented): The method for determining the level of said first fluid in a container according to claim 1 wherein the member comprises one or more of one or more of : leucoauramine, diarylphthalide, polyarylcarbinole, acylauramine, arylauramine, Rhodamine B lactam, indoline, spiropyran, and fluoran; Crystal Violet lactone (CVL), Malachite Green lactone, 2-anilino-6-(N-cyclohexyl-N-methylamino)-3-methylfluoran, 2-anilino-3-methyl-6-(N-methyl-N-propyl-amino)fluoran, 3-[4-(4-phenylaminophenyl)aminophenyl]-amino-6-methyl-7-chlorofluoran, 2-anilino-6-

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(N-methyl-N-isobutylamino)-3-methylfluoran, 2-anilino-6-(dibutyl-amino)-3-methylfluoran, 3-chloro-6-(cyclohexylamino)-fluoran, 2-chloro-6-(diethylamino)fluoran, 7-(N,N-dibenzylamino)-3-(N,N-diethylamino)fluoran, 3,6-bis(diethylamino)fluoran, gamma-(4'-nitroanilino)lactam, 3-diethylaminobenzo[a]-fluoran, 3-diethylamino-6-methyl-7-aminofluoran, 3-diethylamino-7-xylidinofluoran, 3-(4-diethylamino-2-ethoxyphenyl)-3-(1-ethyl-2-methylindole-3-yl)-4-azaphthalide, 3-(4-diethylaminophenyl)-3-(1-ethyl-2-methylindole-3-yl)phthalide, 3-diethylamino-7-chloroanilinofluoran, 3-diethylamino-7,8-benzofluoran, 3,3-bis(1-n-butyl-2-methylindole-3-yl)phthalide, 3,6-dimethylethoxyfluoran, 3-diethylamino-6-methoxy-7-aminofluoran, DEPM, ATP, ETAC, 2-(2-chloroanilino)-6-dibutylaminofluoran, Crystal Violet carbinol, Malachite Green carbinol, N-(2,3-dichlorophenyl)leucoauramine, N-benzoylauramine, Rhodamine B lactam, N-acetylauramine, N-phenylauramine, 2-(phenyliminoethanedilydene)-3,3-dimethylindoline, N,3,3-trimethylindolinobenzospiropyran, 8'-methoxy-N,3,3-trimethylindolinobenzospiropyran, 3-diethylamino-6-methyl-7-chlorofluoran, 3-diethylamino-7-methoxyfluoran, 3-diethylamino-6-benzyloxyfluoran, 1,2-benzo-6-diethylaminofluoran, 3,6-di-p-toluidino-4,5-dimethylfluoran, phenylhydrazide-gamma-lactam, and 3-amino-5-methylfluoran; 3-Z-4-Z₁-5-Z₂-5-(1-R-2-R₁-5/6-Y-3-indolyl)-2(5H)-furanones; 3,5-bis(1-R-2-R₁-5/6-Y-3-indolyl)-2-(3H)-furanones; 2,4-bis(1-R-2-R₁-5/6-Y-3-indolyl)-4-oxobutanoic acids; 4-(1-R-2-R₁-5/6-Y-3-indolyl)-2,3-dichloro-4-oxo-2-butenic acids; phenols, metal phenolates, metal carboxylates, benzophenones, sulfonic acids, sulfonates, phosphoric acids, metal phosphates, acidic phosphoric esters, acidic phosphoric ester metal salts, phosphorous acids, and metal phosphites; gallic acid; gallate such as methyl gallates, ethyl gallate, n-propyl gallate, i-propyl gallate, and butyl gallate; dihydroxybenzoic acids and their esters such as 2,3-dihydroxybenzoic acid and 3,5-dihydroxybenzoic acid methyl; acetophenone derivatives such as 2,4-dihydroxyacetophenone, 2,5-dihydroxyacetophenone, 2,6-dihydroxyacetophenone, 3,5-dihydroxyacetophenone, and 2,3,4-trihydroxyacetophenone; benzophenone derivatives such as 2,4-dihydroxybenzophenone, 4,4'-dihydroxybenzophenone, 2,3,4-trihydroxybenzophenone,

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2,4,4'-trihydroxybenzophenone, 2,2',4,4'-tetrahydroxybenzophenone, and 2,3,4,4'-tetrahydroxybenzophenone; biphenols such as 2,4'-biphenol and 4,4'-biphenol; and polyhydric phenols such as 4-[(4-hydroxyphenyl)methyl]-1,2,3-benzenetriol, 4-[(3,5-dimethyl-4-hydroxyphenyl)methyl]-1,2,3-benzenetriol, 4,6-bis[(3,5-dimethyl-4-hydroxyphenyl)methyl]-1,2,3-benzenetriol, 4,4'-[1,4-phenylenebis(1-methylethylidene)bis(benzene-1, 2,3-triol)], 4,4'-[1,4-phenylenebis(1-methylethylidene)bis(1,2-benzenediol)], 4,4',4''-ethylidenetrisphenol, 4,4'-(1-methylethylidene)bisphenol, and methylenetris-p-cresol; polyalkylene oxide (PAO), $\text{Chr-L}[\text{PAO-L-Chr}]_n$ where each Chr which may be the same or different is a chromophore, each PAO which may be the same or different is a polyalkylene oxide moiety, each L is a bond or organic linking group connecting at least one PAO to at least one Chr, and n is an integer having a value of at least 1; styrene-methacrylic acid copolymer; polyethylene, chlorinated polyethylene, ethylene-vinyl acetate copolymer and ethylene-acrylic acid-maleic anhydride copolymer, polybutadienes, polyesters such as polyethylene terephthalate, polybutylene terephthalate and polyethylene naphthalate, polypropylenes, polyisobutylenes, polyvinyl chlorides, polyvinylidene chlorides, polyvinyl acetates, polyvinyl alcohols, polyvinyl acetals, polyvinyl butyrals, fluorine resins, acrylic resins, methacrylic resins, acrylonitrile copolymers, styrenecopolymers such as polystyrene, halogenated polystyrene and styrene methacrylic acid copolymer, acetal resins, polyamides such as nylon 66, polycarbonates, cellulose resins, phenol resins, urea resins, epoxy resins, polyurethane resins, diaryl phthalate resins, silicone resins, polyimide amides, polyether sulfones, polymethyl pentenes, polyether imides, polyvinyl carbazoles and amorphous polyolefin.

Claim 9. (previously presented): The method for determining the level of said first fluid in said container according to claim 1 where said container is present in a location of low humidity at the time of the initial observing of the first temperature in said first fluid region of said container when said first fluid is present in said first fluid

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region of said container and at the time the subsequent observation of the second temperature in said second fluid region of said container after a portion of said first fluid has been removed.

Claim 10. (previously presented): The method for determining the level of said first fluid in said container according to claim 1 wherein said first fluid is a liquid.

Claim 11. (previously presented): The method for determining the level of said first fluid in said container according to claim 1 wherein said first fluid comprises beer and wherein said second fluid comprises carbon dioxide.

Claim 12. (previously presented): The method for determining the level of said first fluid in said container according to claim 1 additionally comprising the step of applying water to the temperature-measuring device with a water moistened cloth or a spray bottle wherein the temperature of the water applied is from 45 ° F to 80 ° F.

Claim 13 (previously presented): The method for determining the level of said first fluid in said container according to claim 1 wherein the temperature-measuring device is black color at one temperature and green at another temperature.

Claim 14. (previously canceled).

Claim 15. (previously presented): A fluid dispensing assembly comprising:
a sealed container, for when in use, containing a liquid under pressure;
said sealed container having an exterior surface;
said sealed container having input means for maintaining a constant pressure within sealed container
said exterior surface of said sealed container having a heightwise dimension and a widthwise dimension;

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at least one temperature-measuring device positioned heightwise
 dimension on said exterior surface, provided further that said temperature-
 measuring device measures single discrete temperatures in the range of about
 from 45 ° F to 80 ° F; and,

provided further that the temperature measuring device is based on a
 member selected from the group consisting of a leuco dye, a
 clearing point liquid crystal, cholesteric liquid crystal, and mixtures thereof.

Claim 16. (previously presented): The fluid dispensing assembly according to
 claim 15 wherein said input means supplies carbon dioxide to said sealed container.

Claim 17. (previously presented): The fluid dispensing assembly according to
 claim 15 the member comprises one or more of : leucoauramine, diarylphthalide,
 polyarylcannabinol, acylauramine, arylauramine, Rhodamine B lactam, indoline,
 spiropyran, and fluoran; Crystal Violet lactone (CVL), Malachite Green lactone, 2-
 anilino-6-(N-cyclohexyl-N-methylamino)-3-methylfluoran, 2-anilino-3-methyl-6-(N-
 methyl-N-propyl-amino)fluoran, 3-[4-(4-phenylaminophenyl)aminophenyl]-amino-6-
 methyl-7-chlorofluoran, 2-anilino-6-(N-methyl-N-isobutylamino)-3-methylfluoran, 2-
 anilino-6-(diethyl-amino)-3-methylfluoran, 3-chloro-6-(cyclohexylamino)-fluoran, 2-
 chloro-6-(diethylamino)fluoran, 7-(N,N-dibenzylamino)-3-(N,N-diethylamino)fluoran,
 3,6-bis(diethylamino)fluoran, gamma-(4'-nitroanilino)lactam, 3-diethylaminobenzo[a]-
 fluoran, 3-diethylamino-6-methyl-7-aminofluoran, 3-diethylamino-7-xylidinofluoran, 3-(4-
 diethylamino-2-ethoxyphenyl)-3-(1-ethyl-2-methylindole-3-yl)-4-azapht halide, 3-(4-
 diethylaminophenyl)-3-(1-ethyl-2-methylindole-3-yl)phthalide, 3-diethylamino-7-
 chloroanilinofluoran, 3-diethylamino-7,8-benzofluoran, 3,3-bis(1-n-butyl-2-methylindole-
 3-yl)phthalide, 3,6-dimethylethoxyfluoran, 3-diethylamino-6-methoxy-7-aminofluoran,
 DEPM, ATP, ETAC, 2-(2-chloroanilino)-6-dibutylaminofluoran, Crystal Violet carbinol,
 Malachite Green carbinol, N-(2,3-dichlorophenyl)leucoauramine, N-benzoylauramine,
 Rhodamine B lactam, N-acetylauramine, N-phenylauramine, 2-

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(phenyliminoethanedilydene)-3,3-dimethylindoline, N,3,3-trimethylindolinobenzospiropyran, 8'-methoxy-N,3,3-trimethylindolinobenzospiropyran, 3-diethylamino-6-methyl-7-chlorofluoran, 3-diethylamino-7-methoxyfluoran, 3-diethylamino-6-benzyloxyfluoran, 1,2-benzo-6-diethylaminofluoran, 3,6-di-p-toluidino-4,5-dimethylfluoran, phenylhydrazide-gamma-lactam, and 3-amino-5-methylfluoran; 3-Z-4-Z₁-5-Z₂-5-(1-R-2-R₁-5/6-Y-3-indolyl)-2(5H)-furanones; 3,5-bis(1-R-2-R₁-5/6-Y-3-indolyl)-2-(3H)-furanones; 2,4-bis(1-R-2-R₁-5/6-Y-3-indolyl)-4-oxobutanoic acids; 4-(1-R-2-R₁-5/6-Y-3-indolyl)-2,3-dichloro-4-oxo-2-butenic acids; phenols, metal phenolates, metal carboxylates, benzophenones, sulfonic acids, sulfonates, phosphoric acids, metal phosphates, acidic phosphoric esters, acidic phosphoric ester metal salts, phosphorous acids, and metal phosphites; gallic acid; gallate such as methyl gallates, ethyl gallate, n-propyl gallate, i-propyl gallate, and butyl gallate; dihydroxybenzoic acids and their esters such as 2,3-dihydroxybenzoic acid and 3,5-dihydroxybenzoic acid methyl; acetophenone derivatives such as 2,4-dihydroxyacetophenone, 2,5-dihydroxyacetophenone, 2,6-dihydroxyacetophenone, 3,5-dihydroxyacetophenone, and 2,3,4-trihydroxyacetophenone; benzophenone derivatives such as 2,4-dihydroxybenzophenone, 4,4'-dihydroxybenzophenone, 2,3,4-trihydroxybenzophenone, 2,4,4'-trihydroxybenzophenone, 2,2',4,4'-tetrahydroxybenzophenone, and 2,3,4,4'-tetrahydroxybenzophenone; biphenols such as 2,4'-biphenol and 4,4'-biphenol; and polyhydric phenols such as 4-[(4-hydroxyphenyl)methyl]-1,2,3-benzenetriol, 4-[(3,5-dimethyl-4-hydroxyphenyl)methyl]-1,2,3-benzenetriol, 4,6-bis[(3,5-dimethyl-4-hydroxyphenyl)methyl]-1,2,3-benzenetriol, 4,4'-[1,4-phenylenebis(1-methylethylidene)bis(benzene-1, 2,3-triol)], 4,4'-[1,4-phenylenebis(1-methylethylidene)bis(1,2-benzenediol)], 4,4',4''-ethylidenetrisphenol, 4,4'-(1-methylethylidene)bisphenol, and methylenetris-p-cresol; polyalkylene oxide (PAO), Chr-L[PAO-L-Chr]_n where each Chr which may be the same or different is a chromophore, each PAO which may be the same or different is a polyalkylene oxide moiety, each L is a bond or organic linking group connecting at least one PAO to at least one Chr, and n is an integer having a value of at least 1; styrene-methacrylic acid

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copolymer; polyethylene, chlorinated polyethylene, ethylene-vinyl acetate copolymer and ethylene-acrylic acid-maleic anhydride copolymer, polybutadienes, polyesters such as polyethylene terephthalate, polybutylene terephthalate and polyethylene naphthalate, polypropylenes, polyisobutylenes, polyvinyl chlorides, polyvinylidene chlorides, polyvinyl acetates, polyvinyl alcohols, polyvinyl acetals, polyvinyl butyrals, fluorine resins, acrylic resins, methacrylic resins, acrylonitrile copolymers, styrenecopolymers such as polystyrene, halogenated polystyrene and styrene methacrylic acid copolymer, acetal resins, polyamides such as nylon 66, polycarbonates, cellulose resins, phenol resins, urea resins, epoxy resins, polyurethane resins, diaryl phthalate resins, silicone resins, polyimide amides, polyether sulfones, polymethyl pentenes, polyether imides, polyvinyl carbazoles and amorphous polyolefin.

Claim 18. (cancelled): A temperature-measuring device in the form of an elongated thin strip wherein said temperature-measuring device operates at a single discrete temperature.

Claim 19. (cancelled): The temperature-measuring device according to claim 18 wherein the discrete temperature is at from 36 ° F to 56 ° F.

Claim 20. (cancelled): The temperature-measuring device according to claim 18 wherein the discrete temperature is at from 36 ° F to 46 ° F.